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USAFSAM-TR-90-26

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**STATUS REPORT ON MEDICAL MATERIEL
ITEMS TESTED AND EVALUATED FOR USE
IN THE USAF AEROMEDICAL EVACUATION
SYSTEM**

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December 1990

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Final Report for Period March 1986 - April 1990

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**USAF SCHOOL OF AEROSPACE MEDICINE
Human Systems Division (AFSC)
Brooks Air Force Base, TX 78235-5301**



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NOTICES

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The Office of Public Affairs has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This report has been reviewed and is approved for publication.


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PREFACE

This Status Report is intended as a quick reference guide for users (flight surgeons, flight nurses, aeromedical evacuation technicians, and hospital personnel). Requisition of equipment/supply items should be initiated through normal procurement channels.

The Status Report is divided into the following sections:

SECTION I

Medical equipment items evaluated and found acceptable for use aboard aeromedical evacuation aircraft and available from the manufacturer.

SECTION II

Medical equipment items evaluated and found acceptable for use aboard aeromedical evacuation aircraft but are no longer available from the manufacturer. The items are listed here; additional information including manufacturer, date evaluated, summary of the evaluation, and power requirements can be obtained from USAFSAM-TR-86-10 Status Report on Medical Materiel Items Tested and Evaluated for Use in the USAF Aeromedical Evacuation System.

SECTION III

Medical equipment items recently (since USAFSAM-TR-86-10 was published) evaluated and found acceptable for use aboard aeromedical evacuation aircraft; procured by local fabrication or contract.

SECTION IV

Medical equipment items previously evaluated and found acceptable for use aboard aeromedical evacuation aircraft; procured by local fabrication or contract. The items are listed here; additional information can be obtained from USAFSAM-TR-86-10.

SECTION V

Medical equipment items evaluated but not acceptable for use aboard aeromedical evacuation aircraft.

SECTION VI

Medical supply items recently evaluated and found acceptable for use aboard aeromedical evacuation aircraft.

SECTION VII

Medical supply items previously evaluated and found acceptable for use aboard aeromedical evacuation aircraft. The items are listed here; additional information may be obtained from USAFSAM-TR-86-10.

SECTION VIII

Medical supply items previously evaluated but found unacceptable for use aboard aeromedical evacuation aircraft; or no longer manufactured. The items are listed here.

Notes:

The medical equipment items were tested/evaluated/developed primarily for use in the United States Air Force aeromedical evacuation system to include the Aerospace Rescue and Recovery Service.

All electromagnetic interference testing performed after 3 August 1986 was accomplished IAW MIL-STD-461C (category A1e equipment).

The acceptability/non-acceptability designations apply to the routine use of the particular equipment item in the unique aeromedical evacuation environment of the Department of Defense and are not intended as representations to be relied upon by persons or entities outside of the Department of Defense.

The USAFSAM Aeromedical Research Function will provide supplemental information on newly updated/evaluated equipment items as testing is completed. Distribution will be made as needed to units with an interest in aeromedical evacuation.

Additional information can be obtained by calling the USAFSAM Aeromedical Research Function, DSN 240-2937 or commercial (512) 536-2937; or by writing to Aeromedical Research Function, USAFSAM, Brooks AFB TX 78235-5301.

The USAFSAM Aeromedical Research Function will republish this Status Report on an as-needed basis.

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SECTION I

ACCEPTABLE EQUIPMENT ITEMS

Medical equipment items evaluated and acceptable for use aboard aeromedical evacuation aircraft and available from the manufacturer.

Product and Manufacturer

Corometrics Neonatal Cardiac Monitor, Model 506

Corometrics Medical Systems
61 Barnes Park Road N
Wallingford, CT 06492

Telephone: (800) 243-3952

Date Evaluated: April 1990

Description

The Model 506 was evaluated as a component of the International Biomedical Neonatal Transport System. Features include cardiac, blood pressure, respiration, and temperature monitoring.

Summary

The Model 506 may be used independently, or as a component of the Neonatal Transport System. However, it must be modified to conform to MIL-STD-461C, Category A1e. During rapid decompression testing from 10,000 to 40,000 ft, the cathode-ray tube was damaged, making part of the display screen unreadable. This malfunction was not considered a failure since it presented no danger to the patient or personnel; also because of the unlikelihood of such a catastrophic event.

Power Requirements: 120 VAC/60 Hz, 0.17 amp; Internal Battery

Procurement: Manufacturer

Product and Manufacturer

Life Pak 5 Cardioscope/Recorder Module
Life Pak 5 Defibrillator/Synchronizer Module
Life Pak 5 Battery Pak Charger
Life Pak 5 Nickel Cadmium Battery Pak

Physio-Control Corporation
11811 Willows Road
Redmond, WA 98052

Telephone: (800) 426-8047

Date Evaluated: December 1977; May 1979

Summary

The Life Pak 5 Cardioscope/Recorder, DC Defibrillator/Synchronizer Modules and Battery/Pak Charger were found **conditionally** acceptable for use in aeromedical evacuation during the initial testing and evaluation completed in December 1977. Physio-Control Corporation submitted a modified unit for retest and evaluation. Retesting of only the modified areas was accomplished.

The Life Pak 5 Cardioscope/Recorder Module and DC Defibrillator/Synchronizer Module are acceptable for use onboard aeromedical evacuation aircraft. The Battery/Pak Charger can only be considered acceptable if the manufacturer has performed the modifications required to pass vibration testing. Physio-Control Corporation has incorporated the recommended modifications into all of their production models.

Power Requirements: 110 VAC/50-400 Hz, 0.16 amp; Internal Battery

Procurement: Manufacturer

Product and Manufacturer

MRL 450 SL-AF Monitor/Defibrillator/Recorder

Medical Research Laboratories, Inc.
6457 W. Howard
Niles, IL 60648

Telephone: (312) 647-0777

Date Evaluated: November 1984

Description

The MRL 450 SL-AF is a portable Cardiac Monitor/Defibrillator/Recorder. The ECG monitor has a 12.7-cm (5-inch) non-fade scope, digital heart rate display, and a hold push button for analyzing ECG signals. The lead select control allows selection of the leads I, II, III and a "quick-look" paddle option. The QRS beeper volume and QRS sensitivity can be adjusted from the monitor control panel. The monitor has the options of a High/Low heart rate alarm and battery test function which displays the percentage of battery life remaining. The Defibrillator/Synchronizer can provide up to 360 joules of delivered energy in eight discrete levels (5, 10, 20, 40, 80, 160, 240, 360). All defibrillator controls, including a low battery indicator and remote chart recorder switch, are located on the defibrillator paddles. The recorder documents ECG waveforms in either real time or 4-second delay (optional).

Power Requirements: 115 VAC/60-400 Hz, 0.25 amps; 28 VDC; Internal Battery.

Procurement: Manufacturer

Note

Once the defibrillator has been charged, merely turning off the MRL will not release the charge. The paddles must be discharged into the paddle placement location in the MRL cover. Do not discharge into the air or by holding the paddles together.

Product and Manufacturer

AVI Guardian Volumetric Control Delivery System, Model 100

AVI Inc
3M Health Care Group
1120 Red Fox Road
St Paul, MN 55112

Telephone: (800) 336-7657

Date Evaluated: December 1986

Description

The Guardian Volumetric Control Delivery System, Model 100, in conjunction with the AVI Guardian IV Administration Set, is designed to automatically regulate the flow rate of most intravenous and/or intra-arterial infusions. The unit provides a constant, non-pulsating flow at selected rates from 1 to 999 milliliters per hour (ml/hr) in one ml/hr increments with a volume delivered accuracy of $\pm 2\%$. The unit has a battery operation time of approximately eight hours at a flow rate of 125 ml/hr (when fully charged). When the unit has delivered the pre-selected volume to be infused, a visual and audio alarm is activated, and a keep vein open (KVO) rate of 1 ml/hr begins. The unit incorporates an air-in-cassette detector that will detect air bubbles of 0.15 ml or larger.

Summary

Operation of the unit on 115 VAC/400 Hz power is not recommended. Use of the Model 100 on board C-130 and C-141 aircraft should be limited to battery operation, or operation from a frequency converter that provides 115 VAC/60 Hz power. Although the manufacturer's air-in-cassette detector prevented any appreciable air bubbles from passing through the upper pump chamber of the cassette during our evaluation, an in-line filter should still be placed close to the infusion site to remove any air or particles which may occur in the IV fluid. Exposure to subfreezing temperatures for even short periods of time may cause the infusion fluid in the narrow IV tubing to freeze, activating an audio/visual alarm and stopping the fluid flow. To prevent unrestricted flow of IV fluid, always use the manual IV clamp before removing the administration set.

Power Requirements: 115 VAC/50-60 Hz, 0.15 amp; Internal Battery

Procurement: Manufacturer

Product and Manufacturer

Baxter AS*2F Autosyringe

Baxter Health Care Corp
Autosyringe Division
198 Londonderry Turnpike
Hooksett, NH 03104

Telephone: (800) 258-3591

Date Evaluated: February 1982

Description

The Autosyringe Model AS*2F is a portable, battery-powered, programmable infusion pump. The unit delivers a constant infusion by rapidly pulsing many small accurate amounts of medication. It accepts disposable syringes up to 50 ml in overall capacity and can infuse fluids intravenously, subcutaneously, or intra-arterially. Fluid delivery can be controlled independently of the main IV flow by connecting the pump to any of the supplemental injection sites available on most IV infusion sets. The Autosyringe AS*2F can infuse from 1 to 44 ml of fluids at infusion rates of 0.5 hours to 49.5 hours, in steps of 0.5 hours.

Power Requirements: 115 VAC/60 Hz (not tested on 400 Hz), 0.03 amp; Internal Battery

Procurement: Manufacturer

Product and Manufacturer

Biomed Spring-Actuated Infusion Pressor, Cat #51787

Biomedical Instruments Ltd
Box 26100
Tel Aviv 61260 Israel

Date Evaluated: July 1988

Description

The S.A. Pressor allows quick infusion administration from a collapsible plastic bag without the need to hang the bag over the patient. The SA Pressor consists basically of six curved, hardened steel plates. The plates, in two groups of three, are covered by a strong synthetic fabric; the six plates form two large curved plates, fastened at one edge to a common hinge, around which they revolve. A sleeve made from the same synthetic fabric is also attached to this hinge. A long strap is riveted to the free edge of the opposite plate. By pulling the strap, the two groups of three plates are pivoted to the closed position. The other pairs of steel plates can be closed together by clamps. Because of the elasticity, when closed, the plates apply a continuous squeezing force to the bag inserted in the sleeve, and the squeezing force is exercised until the infusion bag is empty. The SA Pressor can be used an estimated 1,000 times and has a minimum shelf life of 10 years when left in the unopened package.

Summary

The care provider must monitor and adjust the drip rate as necessary if the SA Pressor is used for other than a maximum flow. The IV bag fluid level cannot be seen without close inspection

Procurement

Migada, Inc.
150 E. Olive Ave, Suite 215
Burbank, CA 91502

Telephone: (818) 848-3880

Product and Manufacturer

Emergency and Military Infusion System (EMIS)

Migada, Science Based Industrial Park
Box 211
Rehovot 7601 Israel

Date Evaluated: July 1988

Description

The dominant factor differentiating the EMIS set from the regular set is the design of the drip chamber which serves as a trap for air bubbles at the same time. The EMIS drip chamber is made of a rigid transparent material. This configuration ensures that after the chamber is partially filled with fluid, there is no contact between the outlet opening and the air bubble, in any possible position of the chamber. Thus the small amount of air left in the drip chamber enables monitoring of the flow when the drip chamber is held in the upright position, but the air does not escape into the circulatory system. The EMIS has a drop/volume ratio of 20 drops/ml and an accuracy of $\pm 10\%$.

Procurement

Migada Inc.
150 E. Olive Ave, Suite 215
Burbank, CA 91502

Telephone: (818) 848-3880

Product and Manufacturer

IMED 922 Volumetric Infusion Pump
Accuset Disposable Cassette

IMED Corporation
9775 Business Park Ave
San Diego, CA 92131

Telephone: (800) 854-2033

Date Evaluated: May 1977

Summary

The IMED 922 Volumetric Infusion Pump is **conditionally** acceptable for use. The Air-In-Line detector does not sense air bubbles 0.95 cm (3/8 inch) or smaller; therefore, a final inline air eliminator type filter should be used to outgas any air that passes the detector. On line power the IMED exceeded the ground resistance limit by 10 milliohms; therefore, the pump should not be used on an electrically susceptible patient. However, it passed electromagnetic interference tests when operating on battery power, and can be used in the airborne environment. The IMED 922 Infusion Pump should not be operated on line power (110 VAC/50-400 Hz) onboard aeromedical evacuation aircraft. Due to the pump's height and weight, a special securing method will be required.

Power Requirements: 110 VAC/50-400 Hz; Internal Battery

Procurement: Manufacturer. NSN 6515-01-025-8839.

Notes

A fully charged battery will operate for 40 hours at 125 ml/hr under ideal conditions.

The low battery alarm will activate at 5.8 volts and the unit will continue to operate until it falls below 5.5 volts (approximately one hour). The manufacturer recommends battery replacement if, for any reason, battery voltage drops below 4-4.5 volts; however, normal battery life should be at least 2 years.

New units are no longer available from the manufacturer; refurbished only.

Product and Manufacturer

IMED 928 Volumetric Infusion Pump

IMED Corporation
9775 Business Park Ave
San Diego, CA 92131

Telephone: (800) 854-2033

Date Evaluated: November 1983

Description

The IMED 928 Volumetric Infusion Pump is a high rate (0-799 ml/hr), all fluids detector, four-digit volume counter pump.

Summary

The Air-In-Line detector does not sense air bubbles 0.95 cm (3/8 inch) or smaller; therefore, a final inline filter of the air eliminator type should be used to outgas any air that passes the detector. When a rate of 799 ml/hour is selected, rate accuracy is well within the $\pm 2\%$ error factor. A fully charged battery, without battery charger connected, will operate the pump at the selected rate of 799 ml/hr for a period of 5 to 6 hours; and will operate for 25 hours at 125 ml/hr under ideal conditions. Due to the pump's height and weight, a special securing method will be required. The manufacturer recommends battery replacement if the battery voltage drops below 4-4.5 volts; however, normal battery life should be at least 2 years. The low battery alarm will activate at 5.8 volts and the unit will continue to operate until it falls below 5.5 volts (approximately one hour). This unit failed EMI testing on 110 VAC/60 Hz and should not be plugged in aboard the aircraft.

Power Requirements: 110 VAC/60 Hz (not evaluated on 400 Hz), 1.2 amps; Internal sealed gel-cel lead acid batteries

Procurement: Manufacturer

Note

New units are no longer available from the manufacturer; refurbished only.

Product and Manufacturer

IMED 960 Volumetric Infusion Pump

IMED Corporation
9775 Business Park Ave
San Diego, CA 92131

Telephone: (800) 854-2033

Date Evaluated: April 1980

Description

The IMED 960 Volumetric Infusion Pump provides the capability to deliver a set volume per hour. The pump communicates operating conditions and alarm situations to the operator by a readout on the liquid crystal display (LCD) panel and also incorporates an audible alarm. Rates can be selected from one to 999 ml/hr and volume to be delivered can be selected from one to 999 ml. The pump incorporates an all-fluids embolism detector that will detect air bubbles in excess of 0.045 ml (1/4 inch) on the distal side of the cassette.

Summary

The Air-In-Line Detector functioned in accordance with manufacturer's specifications. It is still recommended to incorporate a final filter to outgas any air that might pass the Air-In-Line Detector. The battery volume/capacity with the pump operating at 999 ml/hr is seven hours, at 125 ml/hr 17 hours, and at 50 ml/hr 24 hours.

Power Requirements: 120 VAC/60 Hz (not evaluated on 400 Hz), 0.5 amp; Internal rechargeable battery

Procurement: Manufacturer

New units are no longer available from the manufacturer; refurbished only.

Product and Manufacturer

MTP Model 1001a Infusion Pump

Medical Technology Products, Inc
107 Woodbury Rd
Huntington, NY 11743

Telephone: (516) 549-4350

Date Evaluated: April 1990

Description

The Model 1001a is programmed to deliver IV solutions and blood at flow rates from 0.1 ml to 499.9 ml, and to deliver a pre-set volume from 1 to 999 ml, while reporting the volume delivered up to 9999 ml. Visual and audible alarms include air in line, occlusion, low battery, and tampering. The internal battery is charged by the power transformer. When connected to a power supply by the transformer, the battery is being charged, whether in use or not. Also, when connected to a power supply, the unit is operable regardless of battery condition.

Summary

The Model 1001a requires extensive modification for electromagnetic interference. The Model 1001a must be supplied with the PS6100 battery, which satisfies electromagnetic interference, vibrational, and duration requirements. The bracket securing the internal battery must be reinforced by the manufacturer. **Only MTP Model 1200 tubing should be used.** The battery takes 24 hours to fully charge. When fully charged, it will power the Model 1001a for approximately 30 hours.

Power Requirements: 110-115 VAC/50-400 Hz, 0.03 amp; Rechargeable sealed gel-cell battery, 6 VDC

Procurement: Manufacturer

Note

Using any tubing other than MTP Model 1200 could result in leakage, inaccurate delivery rates, and other problems.

Product and Manufacturer

Travenol Infusion Pump, Model AS20S

Baxter Healthcare Corp
Autosyringe Division
198 Londonderry Turnpike
Hooksett, NH 03106

Telephone: (800) 258-3591

Date Evaluated: April 1990

Description

The Model AS20S was evaluated as a component of the International Biomedical Neonatal Transport System. It is an autosyringe that accepts any size Plastipak (B-D) or Monoject syringe from 1 to 60 ml.

Summary

The AS20S may be used independent of, or as part of, the Neonatal Transport System. Some models of the AS20S are wired to accommodate international voltages. Since these units have not been tested for electromagnetic interference using those voltages, they are not recommended for aeromedical use.

Power Requirements: 105-125 VAC/60Hz, 0.03 amp; Internal nickel cadmium battery

Procurement: Manufacturer

Product and Manufacturer

AMBU Baby Resuscitator with Paedi Valve

AMBU Inc.
7476D New Ridge Rd
Hanover, MD 21076

Telephone: (800) 262-8462

Date Evaluated: April 1976

Description

The AMBU Baby Resuscitator with Paedi Valve, Catalog #83019000, is designed for emergency resuscitation of children from prematurity through three years of age. It consists of a self-filling hand-held compression bulb with a Paedi valve assembly. The valve assembly permits forced insufflation of ambient air, or an air/oxygen mixture to be delivered. Accessories included with the basic unit are the inlet valve for supplemental oxygen, the reservoir tube to increase delivered oxygen concentration, the AMBU OA mask, and the carrying case. Standard face masks, adapters, and endotracheal tubes can also be used with the unit.

Procurement: Manufacturer

Product and Manufacturer

BABYbird Infant Ventilator, Model 5900

Health Care Specialties Division
3M Center Bldg
St Paul, MN 55144

Telephone: (800) 227-7540

Date Evaluated: June 1979

Summary

The BABYbird Ventilator, Model 5900, operated satisfactorily from ground level to 34,000 ft equivalent altitude. The airway pressure at the test lung varied with simulated altitude changes, with rapid decompression causing the greatest change in airway pressure. A pressure relief valve in the airway line reduced the effects of rapid decompressions. The breaths per minute delivered by the BABYbird decreased with an increase in equivalent altitude. The oxygen concentrations at the numbered mixer settings remained relatively constant at ground level and 8,000-ft equivalent altitude. Results of temperature tests indicate the ventilator cannot be operated at ambient temperatures below 4°C (40°F).

Power Requirements: Oxygen 50 psi and Compressed Air 50 psi

Procurement: Manufacturer

Product and Manufacturer

Bear 33 Volume Ventilator

Bear Medical Systems
2085 Rustin Avenue
Riverside, CA 92507

Telephone: (800) 331-BEAR
843-7812 (California Only)

Date Evaluated: June 1989

Description

The Bear 33 is a highly versatile and truly portable adult volume ventilator. Only 20.32 cm (8 inch) high on litter mounting sled, it easily fits on the NATO litter for aeromedical evacuation use. Features include: Digital readout; control, assist control and SIMV modes of ventilation; visible and audible alarm; dedicated meters for both external and internal batteries on the front panel for easy visibility of charge status; oxygen accumulator for enriched oxygen delivery; PEEP compatible for 0 - 20 cm of water; a tamper resistant panel lock that automatically relocks in 15 seconds; non-interchangeable drive lines preventing misconnection; a test button that allows a quick check of displays and the integrity of the LCDs. It also includes a humidifier, Model LS 420.

Summary

The Bear 33 was tested and approved for use on the C-9A, C-130, and C-141B aircraft. The ventilator is not approved for use on any aircraft where an external power supply (AC power) is unavailable. The internal battery should only be used as a back-up power supply. The humidifier has no internal battery, and is powered only by 120 VAC/60 Hz. An in-line oxygen monitor should always be used with the Bear 33. The audible alarms cannot be heard inflight, and the ventilator should be positioned so that the visual alarms can be seen. Though not tested, and therefore not found acceptable, the Bear 33 can also accommodate a 12 VDC external battery.

Power Requirements: 120 VAC/60 Hz, 1.5 amp; 12 VDC Internal Battery.

Procurement: Manufacturer

Product and Manufacturer

Bio-Med Infant Ventilator, Model MVP-10

Bio-Med Devices Inc
8 Bishop Lane
Madison, CT 06443

Telephone: (203) 245-8765

Date Evaluated: April 1990

Summary

The MVP-10 was evaluated as a component of the International Biomedical Neonatal Transport System. The ventilator, designed specifically for neonatal use, is difficult to operate at altitude, because the ventilator parameters require constant monitoring and frequent adjustments. Controls that require adjustment in response to altitude changes are inspiratory time, expiratory time and pressure. For this reason, the MVP-10 may be used only as a component of the Neonatal Transport System, and operated by a trained neonatology team member. In most cases, it is recommended that an approved oxygen-air blender be used to deliver the required gas mixture to the patient. In some cases for gas conservation, such as when used on the C-21 aircraft, it may be more beneficial to NOT use a blender, but to connect the gas lines directly to the ventilator. In either case, the decision will be made by the neonatology team member operating the ventilator. It is strongly recommended that an approved oxygen monitor be used in-line with the ventilator breathing circuit to measure the percentage of inspired oxygen. It is recommended that breathing circuits specifically designed by Bio-Med Devices be used with the MVP-10. During rapid decompression testing from 10,000 to 40,000 ft, the internal valves became inoperable. They resumed operation when altitude was restored to 16,000 ft. Due to this operational limitation, the MVP-10 is approved for aeromedical use, only if accompanied by a neonatology team member who would be available to manually ventilate the infant, if required.

Power Requirements: 50 \pm 5 psi oxygen/compressed air

Procurement: Manufacturer

Product and Manufacturer

Flynn Series III Ventilator with Oxygen Powered Aspirator

O-Two Systems
7 Sinola Court
Novato, CA 94947

Telephone: (800) 387-3405

Dates Evaluated: August 1976, February 1980

Description

The Flynn Series III Ventilator is an effective and dependable method to administer oxygen in an emergency situation. It may be used safely for both adults and children. On the military model, the pressure relief valve is preset to 80 cm H₂O in the ADULT Mode and 40 cm H₂O in the CHILD mode.

Procurement: Manufacturer or NSN 6515-01-061-7811

Note

Previously tested as the Marion-Flynn Ventilator with oxygen-powered aspirator.

Product and Manufacturer

Hope III Adult Resuscitator with Midas Mask (formerly the Hope II)

Ohmeda
P.O. Box 7550
Madison, WI 53707

Telephone: (800) 345-2700

Date Evaluated: July 1978

Summary

Results of tests conducted on the unit indicate it will withstand the stresses of flight without degradation of function. Highest oxygen concentrations are obtained when supplemental oxygen is introduced with the unit fully assembled. The Midas Mask should be used as it has a transparent dome. Care must be taken not to crush the accumulator tube during use as this could create potentially dangerous bag pressures.

Procurement: Manufacturer

Note

This device was previously manufactured as the "Hope II."

Product and Manufacturer

Laerdal Adult Resuscitator, Catalog #870001

Laerdal Medical Corporation
1 Labriola Court
Armonk, NY 10504

Telephone: (800) 431-1055

Date Evaluated: July 1978

Summary

Results of tests conducted on the unit indicate that it will withstand the stresses of flight. Highest oxygen concentrations are achieved when the unit is fully assembled, and supplemental oxygen is introduced at a flow rate of at least 10 liters per minute. When not in use, the bag should be properly folded and stored to prevent possible deformity.

Procurement: Manufacturer

Product and Manufacturer

Laerdal Child Resuscitator, Catalog #860001

Laerdal Medical Corporation
1 Labriola Court
Armonk, NY 10504

Telephone: (800) 431-1055

Date Evaluated: November 1978

Description

The Laerdal Child Resuscitator is for use with children from 18 months to ten years. The safety valve prevents pressures in excess of 35 cm of water from being delivered, unless the valve is manually depressed to allow greater pressure delivery. With the unit completely assembled, oxygen concentrations of almost 100% can be attained with a supplemental oxygen flow of 10 liters per minute.

Procurement: Manufacturer

Product and Manufacturer

Laerdal Infant Resuscitator, Catalog # 850001

Laerdal Medical Corporation
1 Labriola Court
Armonk, NY 10504

Telephone: (800) 431-1055

Date Evaluated: November 1978

Description

The Laerdal Infant Resuscitator provides the capability to manually resuscitate premature infants through children 2 years of age. The safety valve prevents delivery of pressure in excess of 35 cm of water, unless higher pressures are required and delivered by holding the valve in a closed position. Completely assembled and with a supplemental oxygen flow rate of 10 liters per minute, oxygen concentrations of 95 to 99% are attainable.

Procurement: Manufacturer

Product and Manufacturer

Military Transport Respirator, Model TXP

Bird Space Technology
Bird Airlodge
Box 817
Sandpoint, ID 83864

Telephone: (208) 263-7824

Date Evaluated: August 1989

Description

The TXP's small size, lightweight design, and fully pneumatic operation make it ideal for rapid transport use. It is a time-cycled respirator designed with a minimum of controls and features. A non-indexed ventilation rate control knob and two push button controls, for delivering manual inspiratory and expiratory breaths, are all the control features located on the ventilator. Delivered tidal volumes are controlled by adjusting the source gas pressure. A mechanical respirometer, Ohmeda part #220-1800-600, and manual breath count are used to measure delivered volumes and breath rate. A positive end expiratory pressure (PEEP) valve attachment was tested with the respirator and provides PEEP of 1 to 15 cm of water. A composite cylinder, Structural Composite Industries part #1270152-3, and pressure reduction regulator, Ohmeda part #A-50197 are used by the burn team. The cylinder and pressure regulator are carried strapped to the back of a team member using a scuba diver oxygen tank harness.

Summary

This TXP was tested specifically for use by the U.S. Army Institute of Surgical Research, Burn Flight Team at Fort Sam Houston, Texas. This system is approved for use in a one-on-one clinical relationship where constant qualified medical surveillance is provided. The composite cylinder is approved by the Department of Transportation (DOT) for use in a mobile environment. Based on the manufacturer's extensive testing on the cylinder, the DOT approval, and the burn team's years of usage with no signs of degradation, we recommend the cylinders for use in aeromedical transport. For further information on the burn team's operational experience with the TXP, potential users may consult with the U.S. Army Institute of Surgical Research, Burn Flight Team at Fort Sam Houston TX; telephone (512) 221-2943, DSN 471-2943.

Power Requirements: 20 to 60 pounds per square inch gauge oxygen or air

Procurement: Manufacturer

Note: For use on aeromedical evacuation aircraft, the TXP cylinder must be fitted with a pressure relief valve to prevent overpressurization.

Product and Manufacturer

Impact Model 305GR Portable Aspirator

Impact Medical Corp
PO Box 508
West Caldwell, NJ 07006

Telephone: (800) 882-1212

Date Evaluated: October 1985

Description

The Impact Model 305GR is a portable aspirator capable of both oropharyngeal and tracheal suctioning. It is lightweight and comes enclosed in a self-contained polyethylene carrying case. The vacuum can be adjusted from 0 to 550 mmHg. The Model 305GR is similar to the Impact Model 308M Portable Aspirator. The major difference between the models is that the 308M has an internal transformer/rectifier for operation on 110 VAC/50-400 Hz.

Summary

USAFSAM/VNC strongly suggests that users be instructed to keep the lid of the Impact open at all times when the unit is being used. A potential electrical hazard exists if the aspirate canister overflows from the exhaust port when the lid is closed. This warning will be stated in the operator's manual. An additional warning sticker should be placed on the unit itself as a reminder to users.

Power Requirements: 120 VAC/60 Hz, 0.4 amp (Only tested and approved charger is P/N 810-0001-00); Internal rechargeable battery; External 12 VDC

Procurement: Manufacturer

Product and Manufacturer

Impact Model 308M Portable Aspirator

**Impact Medical Corp
PO Box 508
West Caldwell, NJ 07006**

Telephone: (201) 882-1212

Date Evaluated: March 1985, August 1985

Description

The Impact Model 308M is a portable aspirator capable of both oropharyngeal and tracheal suctioning. It is lightweight and comes enclosed in a self-contained polyethylene carrying case. The vacuum can be adjusted from 0 to 550 mmHg.

Summary

USAFSAM/VNC strongly suggests that users be instructed to keep the lid of the Impact open at all times when the unit is being used. A potential electrical hazard exists if the aspirate canister overflows from the exhaust port when the lid is closed. This warning will be stated in the operator's manual. An additional warning sticker should be placed on the unit itself as a reminder to users.

Power Requirements: 115 VAC/50-400 Hz, 1.0 amp; Internal Battery; External 12 VDC

Procurement: Manufacturer

Product and Manufacturer

Laerdal Suction Unit, Model LSU

Laerdal Medical Corp
1 Labriola Ct
Armonk, NY 10504

Telephone: (800) 431-1055

Date Evaluated: April 1990

Description

The Laerdal delivers continuous suction at two rates. At "Full Speed," it will suction 500 ml of water in 3.0 to 5.0 seconds. At "Half Speed," it will suction 500 ml in 3.5 to 5.5 seconds. Operating at "Full Speed" on battery, the unit will operate up to approximately 1 hour; at "Half Speed," up to approximately 2 hours. Actual operating time will vary with battery charge level, work load required, motor speed selection, and overall age and condition of unit.

Summary

The Laerdal was evaluated as a component of the Neonatal Transport System. Due to electromagnetic interference, this unit may be used only when installed within the support structure of the system. **WARNING: DO NOT USE THIS DEVICE OUTSIDE THE NEONATAL TRANSPORT SYSTEM. DOING SO COULD AFFECT THE AIRCRAFT COMMUNICATION OR NAVIGATION SYSTEMS!**

Power Requirements: 110 VAC/60 Hz, 0.6 amp; Internal Battery

Procurement: Manufacturer

Product and Manufacturer

Ohio Intermittent Suction Unit, Cat #6704-1251-901

Ohmeda
P.O. Box 7550
Madison, WI 53707

Telephone: (800) 345-2700

Date Evaluated: July 1976

Description

The Ohio Intermittent Suction Unit is a dual purpose (intermittent or continuous), non-electric vacuum unit. During the intermittent mode of operation, the ON and OFF time cycles are independently adjustable. They are preset at the factory to provide 15 seconds ON and 8 seconds OFF during each complete time cycle. This assures that the drainage will always tend to be moved away from the patient toward the collection bottle. An Allen wrench is provided with the unit to adjust the ON/OFF time cycle. Available vacuum from the unit is adjustable throughout the range of zero to 200 mmHg. The amount of vacuum present when the unit is adjusted to FULL VACUUM is dependent on the vacuum source.

Summary

Currently, only the C-9A aircraft can accommodate the unit. Normally, when used inflight, the aircraft vacuum pump switch need not be turned on. However, minimum vacuum pressure for the unit to operate properly at sea level cabin pressure is at least 300 mmHg. Minimum vacuum pressure at 8,000-ft cabin pressure is at least 350 mmHg. To supply the required vacuum pressure, the C-9A vacuum pump may have to operate throughout the entire flight. To use the Ohio when the aircraft is on the ground, the vacuum pump switch must be turned on.

Power Requirements: An external vacuum supply source provides power for the mechanical action of the unit. The unit will operate on line vacuums from approximately 300 mmHg to 740 mmHg.

Procurement: Manufacturer

Product and Manufacturer

Rico Model RS-6 Fixed/Portable Suction System

Rico Suction Labs Inc.
PO Drawer 2508
Burlington, NC 27215

Telephone: (919) 584-1826

Date Evaluated: June 1976

Description

The Rico Model RS-6 Fixed/Portable Suction System provides continuous vacuum and is effective in oropharyngeal and tracheobronchial suctioning procedures. When operated correctly, the unit can provide in excess of 600 mmHg vacuum. When the tubing is open, it can provide a free air flow rate of 30 liters per minute.

Power Requirements: This unit will operate from the ambulance engine vacuum or double-acting hand pump. When the hand pump is used to operate the unit, performance of the Rico Model RS-6 will be dependent upon the dexterity and strength of the operator.

Procurement: Manufacturer

Product and Manufacturer

Airborne Life Support System (ALSS) Transport Incubator, Model 20H

Airborne Life Support Systems Division
International Biomedical Inc
7651 Airport Blvd
Houston, TX 77061

Telephone: (800) 433-5615

Date Evaluated: April 1990

Summary

This incubator was evaluated as a component of the Neonatal Transport System, manufactured by International Biomedical Inc. The incubator requires modification to conform to MIL-STD-461C, Category A1e. Also, modifications must be made to the hood assembly to keep the inner and outer shells connected together, and to allow for carbon dioxide venting. If the hood side-door is located on the left side, rather than the right, opening of that door should be minimized. Frequent opening will allow the thermostatic sensor located near the door to sense the cooler outside air. This causes the incubator to produce more heat to compensate for the perceived lower temperature, leading to an overheating condition, without alarm activation. To conserve battery life when used on the C-21, the incubator should be pre-warmed using AC power, prior to enplaning. Also, during the flight the cabin temperature should be kept as high as possible.

Power Requirements: 115 VAC/50-60 Hz, 3.0 amps; Internal Battery, 12 VDC, 24 AH Sealed Lead Acid Type

Procurement: Manufacturer

Notes

An external battery is also available, but it has not been evaluated for aeromedical evacuation use.

The Model 20H may be used apart from or as a component of the International Biomedical Neonatal Transport System.

Product and Manufacturer

Airborne Life Support Systems (ALSS) Infant Transport Incubator, Model ALSS 185

Airborne Life Support Systems Division
International Biomedical Inc
7651 Airport Boulevard
Houston, TX 77061-4098

Telephone: (800) 433-5615

Dates Evaluated: October 1988, March 1990

Description

The Model ALSS 185 provides a controlled environment to support an infant's thermal needs during transport, by circulating warmed, humidified air through the chamber. The battery operates the unit for up to 3.5 hours (following 6 hours of charging on 110 VAC) and up to 3 hours (following 6 hours of charging on 110 VAC/400 Hz), while maintaining an infant chamber temperature of 37° C (98.6°F). A digital temperature display along with numerous alarm conditions are incorporated into the unit.

Summary

This unit is susceptible to significant increases in temperature within the infant chamber, when exposed to direct sunlight. This can be avoided by covering the clear Plexiglas hood assembly with an item such as a folded cotton bed sheet. Unless absolutely necessary, do not remove the hood assembly, as it can separate and fall on the infant, the aircraft floor, another patient or crewmember. The USAF Occupational and Environmental Health Laboratory (OEHL) at Brooks AFB, Texas, determined the noise levels within the incubator while on the C-9, C-12, C-21, C-130, C-141 aircraft and UH-1 helicopter, were not loud enough to produce a significant risk to hearing damage; due to the relatively short period of exposure. Currently, there is no commercially available hearing protection equipment for infants. OEHL advises **not** taping ear plugs over infant's ears, as it is of little to no value. An oxygen analyzer should be used whenever supplemental oxygen is used. If more information is required, refer to USAFSAM-TR-89-35, Evaluation of the Model 185 Airborne Life Support Systems Infant Transport Incubator.

Power Requirements: 115 VAC/50-400 Hz, 3.0 amps; 12-14.5 VDC; Internal Battery, 12 VDC, 24 AH Sealed Lead Acid

Procurement: Manufacturer

Note

The Model 185 was retested for electromagnetic interference (EMI) in March 1990. The incubator had been fitted with an improved brushless air circulation motor, Brailsford model T-2NFR. Using the new motor, the 185 passed EMI and is acceptable for aeromedical use.

Product and Manufacturer

Ohio Air-Vac Transport Incubator with Battery Pack

Ohmeda
P.O. Box 7550
Madison, WI 53707

Telephone: (800) 345-2700

Date Evaluated: June 1975

Summary

On units produced prior to 1975 and having serial numbers beginning with AKH, a sticker label stating "Temperature Warning: Check infant compartment temperature" should be in place next to the temperature warning light on the heater and should cover up the "high temp warning."

Power Requirement: 110 VAC/60-400 Hz, 2.0 amps; 12 VDC External Battery Pack (requires 2.0 amps when charging from 110 VAC); 24 VDC

Procurement: Manufacturer

Note

Incubator - P/N 3043226-9000
Nicad Battery Pack - P/N 217-3810-800

Product and Manufacturer

Biochem microSpan 1040A Pulse Oximeter

Biochem International Inc.
W238 N1650 Rockwood Drive
Waukesha, WI 53188

Telephone: (800) 558-2345

Date Evaluated: December 1989

Description

The Biochem microSpan 1040A is a small and portable pulse oximeter. It noninvasively monitors and determines arterial blood oxygen saturation and pulse by measuring changes in the absorption of red and infrared light passed through vascular tissue. Features include easy to read LED displays, perfusion status indicator, high/low SaO₂% and pulse audible and visual alarms, audible pulse tone, adjustable alarm volume and an 18-hour memory which can be downloaded to a strip-chart recorder. Alarm setting switches for SaO₂% and pulse are located on the back and bottom of unit.

Summary

Due to patient movement or vibration of the unit, the pulse rate display may be erratic and unreliable; therefore, it should only be used for trend analysis of the patient pulse rate. Though patient movement or vibration doesn't seem to affect the SaO₂% reading, it should also only be used for trend analysis of the patient's SaO₂%. The 1040A's internal battery will last up to 20 hours.

The unit uses a Model 1044 battery charger/power cord which must be modified with a 1000 μ F capacitor to pass EMI at 400 Hz.

Power Requirements: 115 VAC/60-400 Hz, 0.15 amp; Internal Battery

Procurement: Manufacturer

Notes:

The Model 1044 battery charger/power cord will not adequately fit the Electrical Cord Accessory Set (ECAS) used on the C-130 and C-141B, or the C-9A 115 VAC/60 Hz outlets. A 15.24 cm (6 inch) extension/adaptor (no model number or other designation) was made by the manufacturer to facilitate connection of the Model 1044. The extension adaptor has been EMI tested, and is acceptable for use.

At the time of publication, there were problems charging the 1040A using 50 Hz power at some overseas locations. Further testing and evaluation for 50 Hz use may be required. Regardless of the outcome, the 1040A may be effectively charged on 60 Hz or 400 Hz power and operated on 60 Hz, 400 Hz or internal battery.

Product and Manufacturer

Nellcor N-200 Pulse Oximeter

Nellcor Inc
25495 Whitesell St
Hayward, CA 94545

Telephone: (800) 635-5267

Date Evaluated: April 1990

Summary

The N-200 was evaluated as a component of the International Biomedical Neonatal Transport System. It failed electromagnetic interference testing using 110 VAC as the power source, despite extensive modification. When modified using an "hf suppressor" attached to the patient cable, and a special wrap made of a material called "KV-GARD," the unit passes electromagnetic interference when operated using battery power. Therefore, the N-200 may be used on aeromedical flights only when modified, and only on battery power. **WARNING: DO NOT PLUG IN THE NELLCOR INFLIGHT. DOING SO COULD INTERFERE WITH AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS!**

Power Requirements: 110 VAC/60 Hz, 0.3 amp; Internal Battery

Procurement: Manufacturer

Notes

The N-200, when modified for electromagnetic interference, and when used on battery power, may be used apart from or as a component of the Neonatal Transport System.

The expected battery life is less than 2 hours.

Product and Manufacturer

Bird Air-Oxygen Microblender, Model 3800A

Bird Products Corp
3101 E. Alejo Rd
Palm Springs, CA 92262

Telephone: (800) 328-4139

Date Evaluated: April 1990

Description

The device may be utilized with free flow oxygen administration, mechanical ventilation of adults, pediatrics, and neonates, continuous positive airway pressure, and a combination of mechanical ventilation/free flow oxygen administration. It contains two gas outlets: a primary and an auxiliary outlet.

Summary

The Model 3800A was evaluated as a component of the International Biomedical Neonatal Transport System. The 3800A may be used outside of or as part of the Neonatal Transport System. Following significant changes of altitude, it will be necessary to adjust the blender setting to deliver the same partial pressure of oxygen as that delivered at the previous altitude, as indicated by an oxygen analyzer.

Power Requirements: Compressed Air 50 psi and Oxygen 50 psi

Procurement: Manufacturer

Product and Manufacturer

Pressed Steel Tank Gas Cylinder, Model 3HT1850

Pressed Steel Tank Co, Inc
PO Drawer 10-J
Milwaukee, WI 53201

Telephone: (414) 476-0500

Date Evaluated: April 1990

Summary

The Model 3HT1850 cylinders were evaluated as components of the International Biomedical Neonatal Transport System. They are lightweight and afford longer duration than standard "E" cylinders. Each cylinder has a 64 cubic foot capacity. When used to power the Bio-Med MVP-10 ventilator, depending on the flow rate and respiration rate, one each oxygen and air cylinder could last up to 9 hours. Through coordination with the manufacturer and a review of the Department of Transportation standards, the cylinders were deemed acceptable for aeromedical use only when properly mounted on the Neonatal Transport System.

Procurement: Manufacturer

Product and Manufacturer

MiniOX III Oxygen Monitor

Catalyst Research
3706 Crondall Lane
Owings Mills, MD 21117

Telephone: (800) 851-4500

Date Evaluated: March 1989

Description

The MiniOX III Oxygen Monitor provides continuous oxygen monitoring in a wide variety of medical applications such as respiratory therapy, oxygen therapy, and neonatology care; including in an airborne environment.

The instrument is microprocessor controlled and monitors oxygen concentrations in the full 0-100% range. Features include high/low audible and visual alarms, easy to read digital displays, touch sensitive keypad, low battery alarms, and sensor malfunction indicator. The microprocessor makes the MiniOX III easy to calibrate and very simple to use.

The galvanic oxygen sensor provides fast response time and maintenance free usage. The sensor should operate at least 1 year, and the battery should last approximately 2,000 hours. A tee adaptor, used for calibration and inline respirator monitoring, is provided with each instrument; as is a tee adaptor securing strap, mounting bracket, and carrying case.

Summary

Due to the decrease in partial pressure of oxygen at altitude, if calibrated in flight, a conversion chart must be used to ensure the same level of oxygenation as that achieved at ground level. The chart was developed by USAFSAM/VNC, and should be available whenever the MiniOX III is used in flight.

Power Requirements: One 9 volt alkaline battery

Procurement: Manufacturer

Product and Manufacturer

Timeter Aridyne Medical Air Compressor, Model 3500

Timeter Instrument Corporation
Allied Health Care Products
1720 Sublette Ave
St Louis, MO 63110

Telephone: (800) 444-3940

Date Evaluated: March 1980

Description

The Aridyne 3500 Medical Air Compressor System is designed to supply a continuous source of dry compressed air for respiratory therapy devices which require an external source of compressed air. The system will supply 45 liters per minute (LPM) at 50 psi at ground level. The moisture removal system is automatic, and the moisture removed is drained into a container in the bottom of the cabinet where it evaporates into the atmosphere. The unit is mounted on swivel castors to permit easy movement.

Summary

The Timeter Aridyne 3500 Air Compressor is suitable for use in aeromedical evacuation aircraft up to 8,000 feet cabin altitude. The unit will not provide 50 psi pressure at altitudes above 8,000 ft. 50 psi can be maintained up to 8,000 ft, but both pressure and output flow decreases as altitude increases. Maximum flow rate from this compressor is 45 liters per minute at sea level and 41 liters per minute at 8,000 ft. If this unit is to power a ventilator, insure the air flow is adequate for that ventilator.

Power Requirements: 110 VAC/60 Hz (Unit not tested on 400 Hz), 8.5 amps

Procurement: Manufacturer

Product and Manufacturer

Veriflo Oxygen Regulator, Model 747, P/N 1900231

Veriflo Corporation, Medical Product Division
250 Canal Blvd
Richmond, CA 94804

Telephone: (800) 962-4074

Date Evaluated: August 1983

Summary

The special model, P/N 1900231, is well suited for use onboard the C-141B aircraft. It can be mounted in all seven therapeutic outlets and mounted on the Therapeutic Oxygen Manifold System with minor changes in the inlet and outlet fittings. The model 747-346-PG can be used for compressed air service. It is identical in construction but has the CGA and DISS fittings for compressed air. The standard model 747-540-PG is designed for use when it is necessary to monitor the source pressure; however, its size does not accommodate mounting on the C-141 aircraft.

Procurement: Manufacturer

Product and Manufacturer

CAS Medical Systems Neonatal Blood Pressure Monitor Model 901

CAS Medical Systems Inc
Business Park Dr
Branford, CT 06405

Telephone: (800) 227-4414

Date Evaluated: April 1990

Description

The Model 901 was evaluated as a component of the International Biomedical Neonatal Transport System. It noninvasively uses the oscillometric technique to measure the mean arterial pressure, systolic and diastolic blood pressure of the neonate. The pulse rate is also measured.

Power Requirements: 120 VAC/60 Hz, 0.13 amp, operated with Model 900C
Adapter/Charger; Internal Battery

Procurement: Manufacturer

Note

The Model 901 may be used apart from or as a component of the International Biomedical Neonatal Transport System.

Product and Manufacturer

Compur M 1100 Mini-Centrifuge

Miles, Inc
Diagnostic Division
PO Box 3100
Elkhart, IN 46515

Telephone: (800) 248-2637

Date Evaluated: June 1981

Description

Compur M 1100 Mini-Centrifuge is a hand-size, lightweight centrifuge; designed to give accurate hematocrit readings. It can also be used for plasma extraction.

Power Requirements: Six C-size alkaline batteries.

Procurement: Manufacturer

Product

Extracorporeal Membrane Oxygenation (ECMO) System

Date Evaluated: October 1986

Description

The Aerovac Extracorporeal Membrane Oxygenation (ECMO) System is a transportable heart-lung bypass device used in the treatment of neonate and infant respiratory failure. It was designed for use by the Wilford Hall USAF Medical Center, Neonatal Intensive Care Unit, ECMO Transport Team; and consists of many specialized health devices, support equipment, and medical supplies from several manufacturers. Major components are as follows:

<u>Component</u>	<u>Manufacturer</u>	<u>Function</u>	<u>Power Requirements</u>
Blood Pump Regulator	Local fabrication	Regulates blood flow Holds venous reservoir	115 VAC/60 Hz, 4.0 mA (only during alarm activation)
Blood Pump	Sarns S10K	Pumps blood through system	95-125 VAC/50-60 Hz, 0.4 amp
Temperature Therapy Pump	Gaymar TP-200	Circulates heated water to warm blood	115 VAC/60 Hz, 2.0 amps
Uninterrupted Power Source (UPS)	Topaz 84126-01	Provides continuous 120 VAC/60 Hz	102-132 VAC/60 Hz; Internal Batteries, Two 12-volt, 28 amp-hour total, gel-celled, lead acid.
Venous Reservoir	Model RV-500-1	Receives blood, traps air	N/A
Membrane Oxygenator	SciMed 0800-2A	Artificial lung membrane	N/A
ECMO Cart	Local fabrication	Provides equipment set-up and mobility	N/A

Extracorporeal Membrane Oxygenation (ECMO) System (Cont)

Dimensions

ECMO Cart	14"(H) x 24"(W) x 40"(L)
ECMO Boxes (2 each)	17"(H) x 17"(W) x 19"(L)
Transport Boxes (2 each)	16"(H) x 16"(W) x 21"(L)
Support Equipment	18"(H) x 18"(W) x 24"(L)
Topaz UPS	15"(H) x 7"(W) x 24"(L)
Assembled ECMO (with incubator and NATO litter)	48"(H) x 40"(W) x 90"(L)

The system weighs approximately 200 pounds assembled, and 300 pounds crated.

Summary

As of the evaluation date, Wilford Hall USAF Medical Center was the only USAF medical treatment facility that provides ECMO services. The system is acceptable for use on the C-9A aircraft only. Aeromedical evacuation crewmembers will not operate the system. Users from the medical facility must have received inflight training with the ECMO system, and understand the environmental factors involved. The Topaz UPS must be connected to the 115 VAC/60 Hz aircraft power during flight operation. In-line air filters must be used to trap air bubbles formed at altitude.

Product and Manufacturer

French Vacuum Immobilizer Litter

Coquille International
35, rue du Marechal De Lattre de Tassigny
Box Nr 3
67150 Erstein
France

Date Evaluated: March 1983

Description

The Vacuum Immobilizer consists of an air-tight envelope containing plastic balls. On evacuation of the air, it becomes a lightweight rigid structure for the immobilization and transportation of an injured patient.

Summary

Due to rapid decompression tests failure, the Immobilizer is not acceptable for use onboard fixed-wing aircraft. However, the Immobilizer can be considered acceptable for use onboard rotary-type aircraft, with the caution that the internal pressure/rigidity of the unit must be frequently monitored. The Immobilizer will tend to soften with altitude, but the rigidity is easily adjusted by evacuating more air during ascent. The Immobilizer must be secured on a standard NATO litter. Recommended for added patient safety is the addition of an in-line vacuum gauge to monitor the internal pressure of the Immobilizer. Without an in-line gauge, the Immobilizer feels rigid with as little as 100-200 mmHg; therefore, the mattress could start losing rigidity at an altitude of 4,000 feet, if 100 mmHg is drawn off.

Procurement: Manufacturer

Product and Manufacturer

International Biomedical Corp Neonatal Transport System (NTS)

International Biomedical Inc
7651 Airport Blvd
Houston, TX 77061

Telephone: (800) 433-5615

Date Evaluated: April 1990

Summary

The NTS was evaluated for use on aeromedical aircraft. However, it is not intended for use as standard aeromedical evacuation equipment. It is to be used inflight only when operated by trained neonatology personnel. Components evaluated and found acceptable for use in the NTS are as follows:

<u>Component</u>	<u>Power Requirements</u>	<u>Comments</u>
Incubator, ALSS Model 20H	110 VAC, 3.0 amps Internal Battery	Requires EMI and hood modification
Ventilator, Bio-Med Devices Model MVP-10	Oxygen-Air 50 psi	
Neonatal Monitor, Corometrics Model 506	110 VAC, 0.17 amp Internal Battery	Requires EMI modification
Pulse Oximeter, Nellcor Model N-200	110 VAC, 0.3 amp Internal Battery	Requires EMI modification. May use on battery only.
Neonatal BP Monitor, CAS Medical Systems Model 901	110 VAC, 0.13 amp Internal Battery	
Air-Oxygen Blender, Bird Model 3800A	Air 50 psi, Oxygen 50 psi	
Suction Unit, Laerdal, Model LSU	110 VAC, 0.6 amp Internal Battery	
Oxygen Monitor, MiniOX III	9 Volt Alkaline Battery	
Infusion Pump, Travenol Model AS20S	110 VAC, 0.3 amp Internal Battery	

International Biomedical Inc Neonatal Transport System (Cont)

<u>Component</u>	<u>Power Requirement</u>	<u>Comments</u>
Gas Cylinder, Pressed Steel Tank Company, Model 3HT1850	N/A	

Procurement: International Biomedical Inc

Notes:

The NTS is acceptable for use on the C-9, C-21, and C-141 aircraft.

Substitutions with other components are not permitted unless evaluated and approved by USAFSAM/VNC.

Wooden blocks must be placed under the frame to elevate the unit's wheels off the aircraft floor. Four cargo tie-down straps must be used to secure the NTS.

The NTS must be fitted with an approved oxygen flowmeter to supply oxygen for handbag ventilation.

Crewmembers or neonatology team members may **NOT** secure themselves to the NTS during take-off or landing.

On the C-21, the NTS should be placed on the left side of the cabin. The special mounting system, devised by USAFSAM/VNC, should be used to secure the NTS to the aircraft.

An electrical distribution system is built into the NTS. A single 115 VAC/60 Hz outlet is needed to provide AC power to the system. On the C-141, a converter or inverter is required. On the C-21, there is no AC power available; therefore each component's internal battery life should be considered.

Additional details of individual components can be found within this technical report.

Product and Manufacturer

MedaSonics Ultrasound Stethoscope

**MedaSonics
340 Pioneer Way
Box 7268
Mountain View, CA 94039**

Telephone: (800) 227-8076

Date Evaluated: May 1981

Description

The MedaSonics Ultrasound Stethoscope is a Doppler blood flow detector, designed specifically for detecting blood flow in the arterial and deep venous system of the extremities.

Power Requirements: 9-volt alkaline battery

Procurement: Manufacturer

Notes

A diastolic blood pressure reading cannot be obtained with this unit.

The previous catalog number was BF4A. The new number is BF4B. Electronically and functionally it is the same unit, but with a stronger, sturdier case.

Product and Manufacturer

Ohmeda Low Maintenance Battery Pack, Stock #217-3813-910

Ohmeda Critical Care
9065 Guilford Road
Columbia, MD 21046-1801

Telephone: (800) 527-9209

Date Evaluated: January 1987

Description

The Ohmeda (formerly Ohio) Low Maintenance Battery Pack is a portable rechargeable battery, specifically intended to power the the Ohmeda Air-Vac Transport Incubator. It consists of a single 12 VDC battery and charging module mounted in a two-handled carrying case, incorporating a receptacle that permits attachment of the six-pronged incubator power plug. The non-spill, lead acid battery is completely sealed and maintenance free. The Ohmeda Low Maintenance Battery Pack is an acceptable, inexpensive alternative to the Ohmeda Nicad Battery Pack, Stock #217-3810-800, previously evaluated.

Summary

The battery charge time, from full discharge to full charge, is 14-20 hours. A fully charged battery will normally provide a hood temperature of 32.2°C (90°F) in an ambient air temperature of 21.1°C (70°F) for at least 3 1/2 hours, and provide 1 1/4 hours of operation with the heater continuously operating.

Power Requirements: 120 VAC/50-400 Hz, 3.0 amps

Procurement: Manufacturer

Product and Manufacturer

Remic Headset Communication System, Model 7800H

Remic Corporation
Box 1446
Elkhart, IN 46515

Telephone: (219) 293-4257

Date Evaluated: March 1989

Description

The Model 7800H is a wireless communication headset which may be used by aeromedical evacuation crewmembers (AECMs) while on C-130 and C-141 aircraft. It has a transmission frequency of 49.86 megahertz.

Summary

Since this unit is an intentional emitter of EMI, the transmission output power created excessive electromagnetic noise which interfered with aircraft communications. However, the manufacturer has modified current production models by reducing transmission output power to acceptable levels. A label stating certification for aeromedical evacuation must be on each headset. If the headset has no such label, it should not be used.

Power Requirements: 9-volt alkaline battery

Procurement: Manufacturer

Notes:

The maximum output power must be adjusted to 10 milliwatts (mW).

Modified headsets must be labeled "Approved for inflight use on AE missions," to prevent inadvertent use of unmodified units.

SECTION II

ACCEPTABLE EQUIPMENT ITEMS, NO LONGER MANUFACTURED

Medical equipment items evaluated and acceptable for use aboard aeromedical evacuation aircraft but are no longer available from the manufacturer. The items are listed here; additional information including manufacturer, date evaluated, summary of the evaluation, and power requirements can be obtained from USAFSAM-TR-86-10, Status Report on Medical Materiel Items Tested and Evaluated for Use in the USAF Aeromedical Evacuation System.

Cardiac Equipment

Amb Pak 450 SL-AF Monitor, Defibrillator/Synchronizer,
Recorder, and Battery Charger
Amb Pak Model 500/AT-AF Physiological Monitor
Birtcher Electrocardiograph Recorder, Model 355
Burdick DC180M Defibrillator/Monitor with Serial
Numbers 020003 and below
Burdick ECG Recorder, Model EK-4
Datascope Dual Trace Physiological Monitor, Model 850M
Datascope M/D3 Monitor, Defibrillator/Synchronizer,
Recorder and Support Module II
Datascope Physiological Monitor, Model 850
Datascope Resuscitron DC Defibrillator, Model 680
Hewlett Packard Neonatal Monitor, Model 78260A
Life Pak 3 Portable Battery Operated Defibrillator
Life Pak 4 ECG Monitor, Tapewriter and Defibrillator
Monopulse 807B Defibrillator with Electrocardioscope,
Pacemaker, and Synchronizer
Physio-Control Electrocardiograph Recorder
Tektronic Physiological Monitor, Type 410

Infusion Pumps

Extracorporeal Infusion Pump, Model 1203
Extracorporeal Infusion Pump, Model 1211
Harvard Apparatus Model 2720 Syringe Infusion Pump
Holter Infusion Pump, Model 903
Holter Infusion Pump, Model 911

Respiratory Equipment

AIRbird Adult Resuscitator with Silicone Bag
AMBU Adult Resuscitator with E-2 Valve and NR Valve
Blount Inhalation Therapy Equipment
Twin-O-Vac, Model 3100
Mist-Viva Respirator, Model 3500
Oxygen Flowmeter, Model 3700
Humidifier, Model 3750

Suction Equipment

Automatic Thermotic Aspirator Vacuum Pump,
Model 763N
Laerdal Suction Unit, Transformer/Rectifier
Gomco Aspirator Portable Pump, Model 789

Medical Multipurpose Suction Pump (Sundstrand)
Model 77-500
Mueller Aspirator Pump (Carmody)

Transport Incubators

Narco Air-Shields Mobile Transport Incubator,
Model TI67-1
Ohio Transport Incubator (Modified for Aeromedical
Evacuation)

Air & Oxygen Equipment

BioMarine Oxygen Analyzer, Model 0A202R
BioMarine Oxygen Monitor/Controller, Model 400
BioMarine High Humidity Adapter
Blount Oxygen Flowmeter, Model 3700
Blount Humidifier, Model 3750
Novametrix TcO₂mette Portable TcPO₂ Monitor,
Model 809

Blood Pressure Monitoring Devices

Biomega Blood Pressure/Pulse Oximeter, Model 423B
Medtek BPI 420 Blood Pressure/Pulse monitor
Sphygmometrics Infrasonde Electronic Blood Pressure
Monitor, Model M3010
Ultrasonic Monitor, "Hemosonde," Model 2300

Miscellaneous Equipment

Aquapak Nebulizer Model 500, with 921 Adapter and 091
Aquatherm Heating Unit
Compur M 1000 Mini-Photometer
DePuy Cast-O-Vac Cast Cutter, Model 1049
Dextrometer Reflectance Colorimeter
Gorman-Rupp Patient Thermoregulator, Model RK 250
IVAC Digital Electronic Thermometer with EMI
Suppression Case, Model 810
Stryker Wedge Turning Frame, Model 124

SECTION III

EQUIPMENT ITEMS RECENTLY DEVELOPED, PROCURED BY LOCAL FABRICATION OR CONTRACT

Medical equipment items recently (since USAFSAM-TR-86-10 was published) evaluated and found acceptable for use aboard aeromedical evacuation aircraft; procured by local fabrication or contract.

Product

Neonatal Transport System (NTS) C-21 Securing Plate

Date Evaluated: April 1990

Description

The plate, made of angle iron, measures 8.64 cm (3.40 inches) (l) x 6.60 cm (2.60 inches) (w) x 1.3 cm (0.50 inches) (t) when assembled. When attached to the aircraft seat-rails, four of them are used to secure the NTS to the floor of the C-21. Cargo tie-down straps are clipped to the NTS, and the ratchet ends are hooked to the plates and tightened.

Summary

The plate is an effective device for securing the NTS to the C-21 aircraft. The plates should be used in tandem with wooden support blocks to lift the front of the NTS off the aircraft floor, and standard aircraft seat stops placed between the NTS and each rear plate, adjacent to the plate. Extra care should be taken to avoid overtightening the cargo tie-down straps. Follow securing procedures described in USAFSAM-TR-90-23, Testing and Evaluation of the International Biomedical Inc Neonatal Transport System, available through the Defense Technical Information Center.

Procurement

Local Fabrication. Design plans included in USAFSAM-TR-90-23.

Product

Neonatal Transport System (NTS) Wooden Support Block

Date Evaluated: April 1990

Description

The block, made of hard wood, measures 10.16 cm (4.0 inches) (l) x 10.16 cm (4.0 inches) (w) x 14.73 cm (5.8 inches) (h), with a 2.54 cm (1 inch) x 2.54 cm (1 inch) groove across the top to accommodate the NTS lower frame. When a set of blocks are placed under the frame, they suspend the NTS approximately 1/4 inch off the floor of the aircraft.

Summary

The block is an effective device for providing weight distribution, when securing the NTS on aeromedical aircraft. Without the blocks all the weight, over 200 pounds, is distributed among the four wheels, with each wheel applying over 50 psi to the floor of the aircraft; before tightening with cargo tie-down straps. With the blocks, the weight is more evenly distributed to slightly over 3 psi, before tightening. An added advantage is that there is no stress applied to the NTS wheels, as they are suspended 1/4 inch above the floor. On the C-9 and C-141 aircraft, four blocks are needed; two for the front and two for the rear. On the C-21, two blocks are needed for the front only. The rear frame, with the wheels removed, rests on a four-inch ledge that runs the length of the cabin. Follow securing procedures described in USAFSAM-TR-90-23, Testing and Evaluation of the International Biomedical Inc Neonatal Transport System, available through the Defense Technical Information Center.

Procurement

Local Fabrication. Design plans included in USAFSAM-TR-90-23.

Product

Aeromedical Equipment Securing Pole

Date Evaluated: April 1990

Description

This pole, 22.86 cm (9 inches) long and 3.18 cm (1-1/4 inches) in diameter and made of aluminum, is used for mounting and securing medical equipment on aeromedical evacuation aircraft. It is designed to securely fit into the stanchion litter clamps on the C-130 and C-141B aircraft, as well as into the clamps of the cantilever arms on the C-9A aircraft. When so secured, medical equipment items with securing devices designed to fit the NATO litter pole can be mounted to the device.

Summary

The device works well for mounting several pieces of recently approved aeromedical evacuation equipment, such as the MiniOX III Oxygen Monitor, the Biochem 1040A Pulse Oximeter, and the MTP Infusion Pump. Contract specifications required that those items' mounting devices fit the NATO litter pole. Often, items fitted for the litter pole will fit nothing else on the aircraft. Mounted on a litter pole the items protrude into the aisle of the crowded aircraft, presenting a safety hazard. Using the securing pole is a vast improvement. Installing the pole on the stanchions of the C-130 and C-141B and mounting the equipment on the pole, eliminates the hazard. Visibility is also improved, as the items can be mounted higher on the stanchion. The same method can be employed on the C-9A. A cantilever arm must be dedicated for the pole and equipment item, with the cantilever arm placed at a level close to the patient's litter.

Procurement

Local Fabrication. Design plans can be obtained from the Aeromedical Research Function, USAFSAM/VNL, Brooks AFB, TX 78235-5301.

Product

Aeromedical Equipment Securing Bracket

Date Evaluated: April 1990

Description

This device, with overall dimensions of 20.32 cm (8 inches) wide x 17.15 cm (6-3/4 inches) high x 12.70 cm (5 inches) deep, and made of aluminum, is used for mounting and securing medical equipment aboard aeromedical evacuation aircraft. This device consists of the Aeromedical Equipment Securing Pole, welded into a butterfly shaped bracket which can be secured into the litter stanchion pole track on both the C-9A and C-141B. The bracket locks into the track utilizing a locking mechanism similar to that on the C-9A litter cantilever arm.

Summary

The device works well for mounting several pieces of recently approved aeromedical evacuation equipment, such as the MiniOX III Oxygen Monitor, the Biochem 1040A Pulse Oximeter, and the MTP Infusion Pump. Contract specifications required that those items' mounting devices fit the NATO litter pole. Often, items fitted for the litter pole will fit nothing else on the aircraft. Mounted on a litter pole, the items protrude into the aisle of the crowded aircraft, presenting a safety hazard. Using this device is a vast improvement. Installing the bracket on the stanchions of the C-9 and C-141B and mounting the equipment on the pole, eliminates the hazard. Visibility is also improved, as the items can be mounted higher on the stanchion.

Procurement

Local Fabrication. Design plans can be obtained from the Aeromedical Research Function, USAFSAM/VNL, Brooks AFB TX 78235-5301.

Note

The bracket will not accommodate the C-130 litter stanchion.

SECTION IV

EQUIPMENT ITEMS PREVIOUSLY DEVELOPED, PROCURED BY LOCAL FABRICATION OR CONTRACT

Medical equipment items previously evaluated and found acceptable for use aboard aeromedical evacuation aircraft; procured by local fabrication or contract. The items are listed here. Additional information can be obtained from USAFSAM-TR-86-10.

Suction Equipment

Portable Tracheal Aspirator (Prototype)
SAM Multipurpose Vacuum Pump

Oxygen Equipment

C-141 Therapeutic Oxygen Manifold Distribution System
(TOMS)
Mistogen Electronic Nebulizer, Model EN153A
Mistogen Electronic Nebulizer, Model XEN153
Portable Therapeutic LOX System (5L)

Litter/Litter Accessories

Litter Access Device
Litter Enplaning-Deplaning Device (LEDD)
Litter Equipment Support Device
Litter Linen Lift
Litter Mounted Examination Lamp
Litter/Stryker Frame Respirator Mount
Modesty Curtain, Disposable
Modified Stokes Litter
Multipurpose Aeromedical Tray Holder
Pediatric Safety Net
RF Nurse Call System (MEDICALL)
Septisol Foam (4.6 oz) Dispenser Mount

Miscellaneous Equipment

Clinical Records Rack
Frequency Converter 400/60 Hz Model PS-75-426-1
Inflight Intravenous Bottle Holder
Medical Treatment Chest
SAM Infusion Pump Bubble Detector with Holter
Infusion Pump
Transportable Airborne Therapeutic Station (TATS)
Vickers Aircraft Transit Isolator

SECTION V

UNACCEPTABLE EQUIPMENT ITEMS

Medical equipment items evaluated but not acceptable for use aboard aeromedical evacuation aircraft.

Cardiac Equipment

Burdick DC 180M Monitor/Defibrillator with Serial Numbers 020004 and above.
Reevaluated for 110 VAC/60-400 Hz power input.
Excessive EMI on 60 and 400 Hz power (due to an internal component change by the manufacturer)

Datascope Cardiotron, Model 650, with Model G Power Module
Unreliable under conditions of aeromedical evacuation. Low quality workmanship and construction.

Datascope M/D 2J Monitor/Defibrillator/Synchronizer
Unreliable under conditions of aeromedical evacuation. Scope adversely affected by altitude. Defibrillator adversely affected by vibration.

Datascope M/D 3A Monitor/Defibrillator
Excessive EMI.

Fairfield DMS600 Cardio-Aid Defibrillator
Excessive EMI.

Hewlett-Packard Model 78670A Cardiac Monitor/Defibrillator
Excessive EMI.

Mennen-Greatbatch Cardio Pak 936S Monitor/Defibrillator/Synchronizer/Recorder. Excessive EMI. Adversely affected by extremes in environmental conditions and vibration.

Mennen-Greatbatch Neonatal Monitor, Model 744, with Recorder
Excessive EMI. Adversely affected by vibration and humidity.

Motorola Advanced Portable Duplex Coronary Observation Unit
Excessive EMI.

SpaceLabs 413A Monitor/Digital Readout/Recorder (formerly the Vitatek 413A Neonatal Monitor)
Adversely affected by vibration. Excessive EMI.

Stoelting's Infant Sentry Apnea Alarm, Model 1500 (Previously the AEL)
Sensitive to aircraft vibration.

Tektronix 413 Neonatal Monitor with 400 Series Recorder
Susceptible to high levels of radiated interference in 60 and 400 Hz fields. Affected by extreme environmental conditions and vibration.

Infusion Equipment

Harvard Compact Infusion Pump, Model 975

Deficiency in syringe holders caused syringe walls to deform.

IVAC 400 Automatic Self-Regulating IV Infusion Pump

Pumps air. Not configured for convenient transport, securing, handling, and withstanding vibration.

IVAC 500 Automatic Self-Regulating IV Infusion Pump

Excessive EMI. Adversely affected by changes in cabin pressure.

Sigmamotor TM-20-2 Infusion Pump

Excessive EMI.

Sigmamotor VOLUMET Infusion Pump

Excessive EMI when operating from 115 VAC/60-400 Hz power.

Travenol FLO-GUARD 6000 Volumetric Infusion Pump

Excessive EMI.

Ventilators

Bennett MA-1 Ventilator

Excessive EMI. Failed rapid decompression test.

BioMed Devices P-7 Adult Ventilator

Excessive intrapulmonary peak pressure and tidal volume at altitude. Decreased rate at altitude.

Bird Ventilator Unit, 28 VDC and 110 VAC/60 Hz Compressors, Battery Pack and Charger (Prototypes)

Excessive EMI - 28 VDC and 110 VAC/60 Hz Compressors. Tidal volume sensitive to pressure change.

Bourns BP 200 Infant Pressure Ventilator

Excessive EMI. Airway pressure fluctuations during varying temperatures. Excessive peak airway pressure during rapid decompression.

Monaghan Volume Ventilator, Model 225

Fluidic components are adversely affected by changes in ambient pressure.

Searle VVA Adult Volume Ventilator

Excessive EMI - spirometer and humidifier. Equipment malfunctioned at temperature of 4°C (40°F), and relative humidity 95%.

Siemens-Elma 900B Servo Ventilator

Excessive EMI. Significant sensitivity to high humidity and varying temperatures. Excessive peak airway pressure during rapid decompression.

Suction Equipment

Impact Model 302 Portable Aspirator
Excessive EMI. Unacceptable plug. Electrical shock hazard.

Laerdal Model 790013
Excessive EMI.

Transport Incubators

Air-Shields (Isolette) Transport Incubator, Model TI-58

Possible fire hazard. Bassinette flammable. Audible alarm has excessive EMI.

Armstrong CARE-ETTE Isolation Incubator, Model I90A

Requires battery pack, securing devices for infant and incubator, vented mattress.

Healthdyne Infant Transport System

Excessive EMI.

Mistogen Transport Incubator, Model TI-700

Excessive EMI. Unacceptable battery pack. CO₂ buildup.

Sierracin Cradle Warmer

Excessive EMI. Lack of securing devices.

Vickers Transport Incubator, Model 77

Excessive EMI. Unacceptable battery pack (Liquid Lead Acid).

Blood Pressure Monitoring Devices

Filac Vital Signs Monitor, Model F-600
Erratic operational characteristics.

Infrasonde Electronic Blood Pressure Monitor
Adversely affected by aircraft acoustical noise.

Somatronix Digital Blood Pressure/Pulse Monitor, Model 307
Adversely affected by aircraft noise and vibration.

Sphygmostat Electronic Blood Pressure Monitor, Model B-300
Erratic operational characteristics.

Sphygmostat Electronic Blood Pressure Monitor, Model B-350
Adversely affected by aircraft acoustical noise.

Sphygmostat Pulse Monitor, Model P-75
Electrical shock hazard in battery charging mode.

Humidifiers

Bennett Cascade Humidifier, Model 1900
Excessive EMI.

Bird Heater Nebulizer Tube
Excessive EMI.

Bird Immersion Heater
Possible fire hazard.

Puritan-Bennett Nebulizer with Immersion Heater, Model 126055, PN 12900
Excessive EMI.

Miscellaneous Equipment

Accumed TM-IV Semi-Rigid
Failed Altitude Testing.

Biochem microSpan Pulse Oximeter, Model 3040
Excessive EMI.

Concoa Corp Oxygen Regulator PN 0305-9999
Unable to maintain set pressure during vibration test (pressure control knob rotates).

IV Stat Constant Pressure, Model 250-X
Safety problems during operation.

Ohio Gel Cell 12V Battery Pak
Excessive EMI.

Oximetrix Shaw Catheter Oximeter
Excessive EMI.

Thompson Carrier
Does not possess aerodynamic or rotational stability when exposed to HH-53 rotor wash.

SECTION VI

MEDICAL SUPPLY ITEMS RECENTLY FOUND ACCEPTABLE

Medical supply items evaluated and found acceptable for use aboard aeromedical evacuation aircraft.

Product and Manufacturer

Argyle Sentinel Seal Dual Chest Drainage Unit

Sherwood Medical
1831 Olive St
St Louis, MO 63103

Telephone: (800) 527-1806
392-5859 - Missouri only

Date Evaluated: January 1989

Summary

The Argyle is used to remove air and fluid from the patient's pleural cavity; it consists of a collection, water seal, and suction control chamber. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, a set of check valves prevent cabin air from bubbling backwards through the water seal into the collection chamber.

Procurement: Manufacturer

Notes

As with all chest drainage systems used in aeromedical evacuation, this unit must be used with a Heimlich Valve to prevent cabin air from entering the patient's pleural cavity.

For increased patient comfort, ensure that the Heimlich Valve is mounted close to the patient's chest tube.

The Argyle has a check valve between the chambers so that water from the water seal chamber does not enter the collection chamber, and water in the patient assessment chamber does not enter the water seal chamber. This unit does not allow any cabin air to enter the collection chamber - but a large negative pressure (approximately 260 cm H₂O) may develop at the chest tube. The only way to alleviate the negative pressure is to vent the unit manually so that cabin air is allowed to enter the unit.

To ensure proper operation, manually vent the unit and readjust the water level in the water seal and suction control chamber as necessary after each landing.

Product and Manufacturer

Migada Underwater Chest Drainage Unit

Migada, Inc.
150 E. Olive Ave, Suite 215
Burbank, CA 91502

Telephone: (818) 848-3880

Date Evaluated: January 1989

Summary

The Migada was designed as an emergency treatment device for removing air and fluids from a patient's pleural cavity under field conditions. It consists of two connected collection chambers with the water seal incorporated within the first. Air and fluids both drain through the water seal; fluid accumulates in the collection chamber while the air bubbles through the water seal and flows out of the unit. The water seal separates the patient from the ambient environment. During ascent, air in the drainage tube expands and bubbles out of the unit through the water seal. During descent, cabin air pushes the fluid within the collection chamber back up the drainage tube towards the patient; cabin air may also bubble into the drainage tube. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air and increasing cabin air pressure.

Procurement: Manufacturer

Notes

As with all chest drainage systems used in aeromedical evacuation, this unit must be used with a Heimlich Valve.

For increased patient comfort, ensure that the Heimlich Valve is mounted close to the patient's chest tube.

The Migada does not have suction control capability. Suction applied to the patient must be regulated at the suction source.

Because fluids from the collection chamber will travel up the drainage tube during descent, ensure that the Migada is located well below the patient to prevent complications from the fluid backing into the Heimlich Valve.

Product and Manufacturer

Pleura Gard Chest Drainage System

ConMed Corp
310 Broad St
Utica, NY 13501

Telephone: (800) 448-6506

Date Evaluated: January 1989

Summary

The Pleura Gard is used to remove air and fluid from the patient's pleural cavity; it consists of collection, water seal, and suction control chambers. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, cabin air bubbles backwards through the water seal into the collection chamber. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air.

Procurement: Manufacturer

Notes

As with all chest drainage systems used in aeromedical evacuation, this unit must be used with a Heimlich Valve.

For increased patient comfort, ensure that the Heimlich Valve is mounted close to the patient's chest tube.

During ascent and descent the changing cabin air pressure forces the water levels to move between the different chambers of the unit. To ensure proper operation, readjust the water level in the water seal and suction control chamber as necessary after each landing.

During descent, water from the water seal chamber will move into the collection chamber. This will dilute the patient's fluids which have accumulated and this additional fluid must be accounted for when measuring the patient's output.

Product and Manufacturer

Thora Drain III Underwater Chest Drainage System

Sherwood Medical Co
1831 Olive St
St Louis, MO 63103

Telephone: (800) 527-1806
(800) 392-5859 - Missouri only

Date Evaluated: January 1989

Summary

The Thora Drain III is used to remove air and fluid from the patient's pleural cavity; it consists of a collection, water seal, and suction control chamber. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, cabin air bubbles backwards through the water seal into the collection chamber. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air.

Procurement: Manufacturer

Notes

As with all chest drainage systems used in aeromedical evacuation, this unit must be used with a Heimlich Valve.

For increased patient comfort, ensure that the Heimlich Valve is mounted close to the patient's chest tube.

During ascent and descent the changing cabin air pressure forces the water levels to move between the different chambers of the unit. To ensure proper operation, readjust the water level in the water seal and suction control chamber as necessary after each landing.

Product and Manufacturer

Thora-Klex Chest Drainage Unit

Davol Inc
Div CR Bard Inc
PO Box 8500
Cranston, RI 02920

Telephone: (800) 556-6275

Date Evaluated: January 1989

Summary

The Thora-Klex is used to remove air and fluid from the patient's pleural cavity; it consists of a collection, water seal, and suction control chamber. Fluid accumulates in the collection chamber while air from the patient's pleural cavity bubbles through the water seal and out of the unit. The water seal separates the patient's collection chamber from the ambient environment. During ascent, air in the collection chamber expands and bubbles out of the unit through the water seal. During descent, cabin air bubbles backwards through the water seal into the collection chamber. Use of a Heimlich Valve protects the patient from the possible deleterious effects of dirty cabin air.

Procurement: Manufacturer

Notes

As with all chest drainage systems used in aeromedical evacuation, this unit must be used with a Heimlich Valve.

For increased patient comfort, ensure that the Heimlich Valve is mounted close to the patient's chest tube.

During ascent and descent the changing cabin air pressure forces the water levels to move between the different chambers of the unit. To ensure proper operation, readjust the water level in the water seal chamber as necessary after each landing.

The water seal chamber can only be filled using a needle and syringe.

Suction applied to the patient is adjusted by turning a "thumb screw". Suction can be accurately delivered, but the "thumb screw" is affected by aircraft vibrations so that the applied suction will vary between 8 and 41 cm H₂O negative pressure throughout the flight.

Product and Manufacturer

Nelkin/Piper Digital Thermometer, Model 268

Nelkin/Piper International
811 Wyandotte St.
P.O. Box 807
Kansas City, MO 64141

Telephone: (800) 523-7521

Date Evaluated: March 1987

Description

The Nelkin/Piper Digital Thermometer, Model 268 is a small, lightweight thermometer designed for oral and axillary use. A liquid crystal display indicates body temperature in degrees Fahrenheit (°F), with a range of 89.6° to 107.7°F (32° to 42°C). The °F indicator in the display flashes until the unit is finished measuring temperature. To conserve battery life, an automatic power off feature turns the thermometer off approximately eight minutes after the device is turned on. The thermometer is supplied with a plastic storage container and disposable probe covers.

Power Requirements: 1.55 VDC, Internal Type SR41 silver oxide battery

Procurement: Manufacturer

Note

Users should closely supervise all patients utilizing this device to prevent the thermometer's sensor or sensor stem from being bent, bitten, or dropped. The liquid crystal display on the Model 268 is significantly smaller than the display on the Model 270.

Product and Manufacturer

Nelkin/Piper Digital Thermometer, Model 270

Nelkin/Piper International
811 Wyandotte St.
P. O. Box 807
Kansas City, MO 64141

Telephone: (800) 523-7521

Date Evaluated: March 1987

Summary

The Nelkin/Piper Digital Thermometer, Model 270 is a small, lightweight thermometer designed for oral, axillary, and rectal use. A liquid crystal display indicates body temperature in degrees Fahrenheit ($^{\circ}\text{F}$), with a range of 95.0° to 107.6°F (35° to 42°C). The $^{\circ}\text{F}$ indicator in the display flashes until the unit is finished measuring temperature. To conserve battery life, an automatic power off feature turns the thermometer off approximately 15 minutes after the unit is turned on. The thermometer is supplied with a plastic storage container and disposable probe covers.

Power Requirements: 1.55 VDC, Internal Type SR41 silver oxide battery

Procurement: Manufacturer

Note

Users should closely supervise all patients utilizing this device to prevent the thermometer's sensor or sensor stem from being bent, bitten, or dropped. The liquid crystal display on the Model 270 is significantly larger and easier to read than the display on the Model 268.

Product and Manufacturer

Takeda Medical Digital Thermometer, Model UF-10

Takeda Medical Inc.
17945-G Skypark Circle
Irvine, CA 92714

Telephone: (714) 630-1779

Date Evaluated: March 1987

Description

The Takeda Medical Digital Thermometer, Model UF-10 is a small, lightweight thermometer designed for oral and axillary use. A liquid crystal display indicates body temperature in degrees Fahrenheit (°F), with a range of 89.6° to 107.6°F (32° to 42°C). To conserve battery life, an automatic power off feature turns the thermometer off approximately 12 minutes after the unit is turned on. The thermometer is supplied with a plastic storage container and disposable probe covers.

Power Requirements: DC, Internal Type LR44 alkaline manganese dioxide battery

Procurement: Manufacturer

Note

Users should closely supervise all patients utilizing this device to prevent the thermometer's sensor or sensor stem from being bent, bitten, or dropped, and to prevent the internal battery from being accidentally ingested.

Product & Manufacturer

Arm-A-Flow IV Flow Regulator

3M AVI
1120 Red Fox Rd
St Paul, MN 55112

Telephone: (800) 336-7657

Date Evaluated: July 1988

Description

The Arm-A-Flow regulator is a gravity-flow infusion device that uses a pressure-sensitive diaphragm in addition to a valve to control intravenous (IV) flow. This regulator is placed between the IV administration set and the catheter, and is an accurate way of controlling the IV flow instead of using the administration set IV tube clamp. In contrast to electronic flow controllers which control the flow by counting the drops, the Arm-A-Flow regulator controls flow by monitoring changes in pressure. The pressure sensitive diaphragm automatically readjusts the orifice opening when there is a change in flow so that the difference is accommodated for, and the solution continues to be dispensed at the set rate. The regulator is made of plastic, is disposable and portable, and does not require a power supply. The Arm-A-Flow regulator does not generate a pressure capable of infusion; therefore, maintaining the height of the IV bag at 60.96 - 91.44 cm (24 -36 inches) above the administration site is essential to this gravity-dependent system.

Summary

The regulator provides a reliable means of controlling IV drip rates during field operations, when transporting patients, and when a power supply is not available. The regulator is not a replacement for an electronic infusion pump. The height of the IV bag to the administration site must be maintained if used in a gravity-dependent IV set-up.

Procurement: Manufacturer

Product and Manufacturer

Biosources International Amplifying Stethoscopes, Models C-2000 and KR-700

Biosources International Inc.
6525 Washington St
Yountville, CA 94599

Telephone: (707) 944-0645

Date Evaluated: June 1985

Description

The Model C-2000 and Model KR-700 amplifying stethoscopes function on mechanical and acoustical principles without moving parts, batteries, or wires. They deliver excellent audible signals of blood pressure, respiration, and heart beat, while effectively rejecting extraneous aircraft noise. The Model C-2000 utilizes a dual transmission tube while the Model KR-700 employs a single transmission tube. A transducer guard is included with the Model C-2000 to prevent accidental damage to the stethoscope head during storage.

Procurement: Manufacturer

Product and Manufacturer

Chad Oxymizer Oxygen Conserving Nasal Cannula

CHAD Therapeutics, Inc.
21630 Lasser St
Chatsworth, CA 91311

Telephone: (800) 423-8870

Date Evaluated: December 1986

Summary

The Chad Oxymizer, Oxygen Conserving Nasal Cannula, was compared with the currently used nasal cannula, NSN 6515-00-246-3782. During ground level and altitude evaluations, the Chad Oxymizer required an average of 40% less oxygen flow to achieve a 98% oxygen saturation level on human subjects, compared to the currently used nasal cannula. The Chad Oxymizer also withstood extreme hot and cold temperature storage and rapid decompression tests with no appreciable physical damage or performance degradation.

Power Requirements: Oxygen source (medical grade, 100%) with adjustable flowmeter and tapered output fitting for cannula attachment.

Procurement: Manufacturer

SECTION VII

MEDICAL SUPPLY ITEMS PREVIOUSLY FOUND ACCEPTABLE

Medical supply items previously evaluated and found acceptable for use aboard aeromedical evacuation aircraft. The items are listed here, additional information may be obtained from USAFSAM-TR-86-10.

Oxygen Supplies

Bard-Parker Nebulizer Heater Jacket
Bird Free Flow Humidification Kit

Closed Urinary Drainage Systems

Curity Monoflo Drainage Bag and Curity Urine Meter with
Aspirating Port
Dover Urinary Drainage Bag and Urine Meter with
Flo-Check Valve
Dynacor Closed Urinary Drainage System

Miscellaneous Supplies

Aero-West Aerosol Dispenser with "Dear John" Aerosol
Model 510H-15
Disposable Ashtray
Disposable Oxygen Masks
Heimlich Valve
Kamen-Wilkinson Foam Cuff and Endotracheal Tube
Litter Back-Rests
Pleur-Evac Adult-Pediatric Chest Drainage Unit,
Model A-4000
Pleur-Evac Adult-Pediatric Chest Drainage Unit,
Model A-4010
Tempa-Dot Single Use Oral Thermometer
Viaflex Plastic IV Containers

SECTION VIII

MEDICAL SUPPLY ITEMS UNACCEPTABLE OR NO LONGER MANUFACTURED

Medical supply items previously evaluated but found unacceptable for use aboard aeromedical evacuation aircraft; or no longer manufactured. The items are listed here. Additional information may be obtained from USAFSAM-TR-86-10.

Not Acceptable For Use

DIAL-A-FLO Device
Abbott Drainbag 2000
Blount Oxygen Flow Meter
Stryker Case Cutter Plaster VAC, Model 845
Travenol Cystoflo II Urinary Drainage Bag

No Longer Available From the Manufacturer

Lanz Endotracheal Tube with McGinnis Cuff
Redi-Temp Heat/Cold Therapy System
Uni-Temp Single Use Thermometer

ACKNOWLEDGMENTS

We would like to thank those who contributed to the compilation of the **Status Report on Medical Materiel Items Tested and Evaluated for Use in the USAF Aeromedical Evacuation System**. We would particularly like to thank the following:

Lt Col (Dr) Mark Swedenburg
Lt Col (Dr) John Marshall
Lt Col Richard Knecht
Maj Garye Jensen
Capt Terry Lewis
Capt Susan Nagel
1Lt Rebecca Schultz
MSgt Rufino Navalta
MSgt Ernie Roy
MSgt Gary Jenkins
TSgt R.J. Van Oss

SUPPLEMENTARY

INFORMATION



EKRAA

DEPARTMENT OF THE AIR FORCE
ARMSTRONG LABORATORY (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235-5000

REPLY TO
ATTN OF:

CFTS (Aeromedical Research Function)

21 OCT 1991

SUBJECT:

Changes and Additions to USAFSAM-TR-90-26

TO Special Distribution List

1. Attachment 1 lists the latest changes and additions to USAFSAM-TR-90-26, Status Report on Medical Materiel Items Tested and Evaluated for Use in the Aeromedical Evacuation System. Please make pen and ink changes and page additions as indicated.

2. For additional information, please contact myself or MSgt Philbeck at Armstrong Laboratory/CFTS, Brooks AFB, TX 78235-5301; (512) 536-2937 (DSN 240-2937).

Richard J. Knecht

RICHARD J. KNECHT, Lt Col, USAF, NC
Chief, Aeromedical Research Function

Atch
Change Page Instructions

AD A 239479

91-15010



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Attachment, Change Page Instructions

1. Insert the attached pages as indicated. For example, page 4-1 is placed after page 4.
2. Make the following pen and ink changes:

Page iv, PREFACE

Lines 18, 21, 23, and 24: Delete "USAFSAM"; replace with "Armstrong Laboratory."

Page v, TABLE OF CONTENTS

Cardiac Equipment

After the line starting "MRL 450..." add the following lines:

LIFEPAK 10 Cardiac Monitor-Defibrillator	4-1
LIFEPAK Battery Support System (BSS).....	4-2
ProPac Vital Signs Monitor Model 106	4-3

Suction Equipment

After the line starting "Rico Model RS-6..." add the following line:

Impact 308M Intermittent Suction Timer Box and Three-Way Manifold.....	28-1
--	------

Page vi

Air & Oxygen Equipment

After the line starting "Veriflo Oxygen Regulator..." add the following line:

10-Liter Patient Therapeutic Liquid Oxygen (PT LOX) Converter, Model CRU-87/U.....	38-1
---	------

Miscellaneous Equipment

After the line starting "Model 7800H..." add the following line:

Vanner Electrical Inverter Model SP 00112	48-1
---	------

Page vii

Line 5: Delete the words "Equipment Securing"

Line 6: Delete the words "Aeromedical Equipment Securing," replace with "Waters."

Add the following line:

Horton Bracket.....57-1

Page 3

Add the following lines:

Note

Life Pak 5 batteries may be charged by the Physio-Control Battery Support System (BSS), which was evaluated and approved in 1991.

Page 4

Line 6: Change "(312)" to "(708)."

Page 16

Line 6: Change "(800) 331-BEAR, 843-7812 (California Only)" to "(800) 232-7633, (714) 788-2460"

Add the following lines:

Note:

On the C-130 and C-141B aircraft, the Bear 33 may be powered by the Vanner Power Inverter Model SP 00112. However, the Bear Humidifier Model LS 420 may not be powered by the Vanner.

Page 25

Line 18: Change "1.0 amp" to "2.0 amp."

Add the following lines:

Note:

By attaching the Impact 308M Intermittent Suction Timer Box, the Model 308M has intermittent suction capability. For more information, refer to page 28-1.

Page 51

Delete lines 7 and 8, starting with "Ohio..."

Page 56

Line 2: Delete the words "Equipment Securing"

Line 25: Delete the acronym "USAFSAM/VNL;" replace with "Armstrong Laboratory/CFTS."

Page 57

Line 2: Delete the words "Aeromedical Equipment Securing;" replace with "Waters."

Line 24: Delete the acronym "USAFSAM/VNL;" replace with "Armstrong Laboratory/CFTS."

Page 65

Add the following lines:

Gomco Suction Units Models 6003 and 6053
Failed EMI testing.

Page 69

Add the following lines:

Vanner Electrical Inverter, Model 24-1500
Failed EMI testing.

Page 86

Under "Not Acceptable For Use," add the following line:

Medical Technology Inc Infusion Pump Tubing Sets (all models except 1200)

Product and Manufacturer

LIFEPAK 10 Cardiac Monitor-Defibrillator

**Physio Control
11811 Willows Road Northeast
Post Office Box 97006
Redmond, WA 98073-9706**

Telephone: (206) 867-4000

Date Evaluated: January 1991

Summary

The LIFEPAK 10 is a portable monitor and defibrillator. It is battery powered and contains a cathode ray cardioscope, which displays real time electrocardiographs, and two defibrillator paddles which may discharge any of nine selectable energy levels. The LIFEPAK 10 may be used inflight only if electromagnetic interference (EMI) modifications are made and identified by the number "43" at the end of the part number. The LIFEPAK 10 holds three nickel-cadmium batteries which are alternately used to power the device. Total operating time for the three batteries is approximately two hours. The LIFEPAK Battery Support System, described on page 3-2, may be used to charge extra batteries.

Power Requirements: 3 Nickel-Cadmium Batteries

Procurement: Manufacturer

Product and Manufacturer

LIFEPAK Battery Support System (BSS)

Physio Control
11811 Willows Road Northeast
Post Office Box 97006
Redmond, WA 98073-9706

Telephone: (206) 867-4000

Date Evaluated: January 1991

Summary

The BSS is used to charge Nickel-Cadmium batteries used in LIFEPAK 5 and LIFEPAK 10 monitor-defibrillators. It must be modified to meet MIL-STD-461C for electromagnetic compatibility, and must be labeled as such.

Power Requirements: 120 VAC, 60-400 Hz, 1.6 amps

Procurement: Manufacturer

Note

When initially plugged in with 3 depleted batteries in place, there will be a short (<1 sec) current draw of approximately 3.2 amps.

Product and Manufacturer

ProPac Vital Signs Monitor Model 106

Protocol Systems, Inc.
14924 N.W. Greenbriar Pkwy
Beaverton, OR 97006

Telephone: (503) 645-2500

Date Evaluated: February 1991

Summary

This device can monitor electrocardiograph (ECG), non-invasive blood pressure, and temperature. It also features an ECG recorder. Additional capabilities exist, but the evaluated model passed electromagnetic interference (EMI) testing (after modification) only with those features listed. To be used inflight, the 106 must be modified to comply with MIL-STD 461C EMI standards; and must be so labeled.

Power Requirements: 120 VAC, 60 Hz, 0.2 amps; Lead acid battery with internal charger

Procurement: Manufacturer

Product and Manufacturer

Impact 308M Intermittent Suction Timer-Box and Three-Way Manifold

**Impact Instrumentation, Inc.
P.O. Box 508
West Caldwell, New Jersey 07006**

Telephone: (201) 882-1212

Date Evaluated: March 1991

Description: The intermittent suction timer-box and three-way manifold are attachments that adapt the Impact 308M suction unit to provide intermittent suction to 3 suction cannister setups, theoretically for 3 patients. The timer-box is basically a two-outlet receptacle box. One receptacle provides 120 volts alternating current (VAC); while the second receptacle provides 120 VAC cycling on every minute for 15 seconds, and off for 45 seconds. The timer-box may be plugged into either 60 or 400 Hz 120 VAC power source.

The three-way manifold, which is mounted on a board and sits adjacent to the 308M suction device, will replace the standard manifold of the 308 M suction device. It has an adjustable pressure gauge, which measures the negative pressure to the 3 suction cannister setups.

Summary: The 308 intermittent timer box and three-way manifold are acceptable for use on aeromedical evacuation aircraft. The following requirements must be met when using this setup:

- a. The box shall only be used with a 308 M suction unit that has a 250 VAC/3 Amp slow-blow fuse installed in the input power circuit.
- b. The main vacuum control knob tends to spontaneously move, due to vibration. For this reason, it is essential that each of the 3 suction setups be monitored for degradation of suction.

Power Requirements: 120 VAC/60-400 Hz

Procurement: Manufacturer

Product and Manufacturer

10-Liter Patient Therapeutic Liquid Oxygen Converter (PT LOX), Model CRU-87/U

Essex Cryogenics of Missouri, Inc.
8007 Chivvis Drive
St. Louis, MO 63123-2395

Telephone: (314) 832-8077

Date Evaluated: January 1987, November 1990

Description and Summary: The PT LOX, which stores up to 10 liters of liquid oxygen, was designed to deliver therapeutic gaseous oxygen at 15 lpm, for up to three patients. A converter changes the liquid oxygen to its gaseous state, which is then passed through two heat exchangers that elevate the delivery temperature to 15.5 to 26.6 °C (60 to 80 °F). A pressure regulator reduces the gas pressure to 50±5 psi before it reaches the three supply outlets, located on the upper surface of the container assembly. Ten liters will provide oxygen at 15 lpm to 3 patients for approximately 3 hours.

Follow-up Testing: We found that the PT LOX can be used to deliver oxygen to four patients (using a Y-connector) up to 15 lpm each, for a total of 60 lpm. The flowmeters require 50 psi to give an accurate flow, and the flowmeters provided with the PT LOX have no indicator of flow actually delivered. For this reason, it is recommended that when more than three patients are being serviced, and/or the flow exceeds 45 lpm, the patients should be monitored with pulse oximeters to ensure they are being adequately oxygenated. It is also recommended that, when using Y-connectors or flowrates above 45 lpm, a flowmeter (such as the Ohio/Ohmeda) be used. This will insure that a decrease in flow will be readily noticeable.

General Use with Ventilators: Each ventilator uses oxygen in a different manner. Ventilators that do not need a 50-psi source and have flow rates less than 65 lpm can be safely used with the PT LOX. Ventilators that need a 50 psi source will most likely operate, if they do not require flow rates above 45 lpm. These and all others should be looked at on a case-by-case basis. Heated humidifiers, oxygen monitors, and pulse oximeters should always be used.

Procurement: Manufacturer

Product and Manufacturer

Vanner Electrical Inverter, Model SP 00112

Vanner Incorporated
4282 Reynolds Dr.
Hilliard, OH 43026

Telephone: (614) 771-2718

Date Evaluated: February 1991

Summary

The Vanner is used to change 24 to 28 VDC aircraft power into 120 VAC/60 Hz power so that it may power medical equipment items requiring "household current." It can be powered by the 28 VDC Cannon-type plugs on the C-130 and C-141B. It will provide up to 10.85 amps of 120 VAC when using the Cannon-type plugs on each aircraft. The 15-ft 4-ga cable that is provided with the Vanner is the only cable that may be used to connect to aircraft power. **Only certain medical equipment items may be powered by the Vanner. Those are the Bear 33 ventilator, Bard-Parker wrap-around nebulizer heater, Impact Model 308M suction, and the Protocol ProPac Model 106 vital signs monitor. No other devices may be powered by the Vanner without prior laboratory testing.** The Vanner must be fitted with a remote switch by-pass plug. When secured on the aircraft, at least four inches of clearance must be around and above the Vanner. Whenever maintenance is performed, broken or displaced tie-wraps must be checked.

Power Requirements: 28 VDC

Procurement: Manufacturer

Product

Horton Bracket

Date Evaluated: September 1991

Description

This C-shaped bracket was designed to be mounted vertically, with each end secured to 2 in-place litter pole handles; or to the litter stanchion, (with adapter poles to interface between the bracket and litter clamps or cantilever arms). The bracket is hollow and made of aluminum, although earlier versions fabricated by the 9th Aeromedical Evacuation Squadron in the Pacific Theater were made of stainless steel. The length is adjustable, to accommodate the variable distance between litters, but the minimum length is 19 in., to allow horizontal mounting on the end of one litter. The Baby Bird infant ventilator, IMED 928 infusion pump, MiniOX III oxygen monitor, Biochem 1040A pulse oximeter, MTP 1001a infusion pump and other items may be mounted on the Horton Bracket.

Procurement

Local Fabrication. Design plans can be obtained from the Aeromedical Research Function, Armstrong Laboratory/CFTS, Brooks AFB, TX 78235-5301.